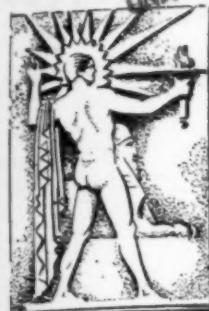


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SCIENCE NEWS-LETTER

The Weekly Summary of Current Science
A SCIENCE SERVICE PUBLICATION

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May 4, 1929



A CLOSE-UP OF MARS

An Artist Shows How Mars Looks from Phobos
(See page 270)

Vol. XV

No. 421

Fourteen Elected to Science Academy

General Science

Fourteen Americans and five foreigners were honored by the National Academy of Sciences at the concluding session of their annual spring meeting, either by election to membership or to the foreign associate-ship.

Prof. Arnold Sommerfeld, famous physicist of Munich, Germany, who attended the scientific sessions of the meeting as a guest, was one of the newly-elected foreign associates. The others included Richard Hertwig, zoologist, also of the University of Munich; C. de la Vallée-Poussin, professor of analytical mechanics at the University of Louvain; Willem de Sitter, of the observatory of Leiden, Holland, and Frederick Orpen Bower, British botanist, formerly Regius Professor of Botany at the University of Glasgow.

A Close-up of Mars

Astronomy

In one of H. G. Wells' delightful short stories a crystal egg on the earth is so in tune with one on Mars that by looking into the terrestrial one, the scene surrounding the Martian crystal appears. The owner of the crystal identifies the scene as on Mars because of the motions of the two moons which periodically appear.

Some such device would be needed to see the view represented on our cover this week; only the second crystal would have to be on Phobos, Mars' inner moon. Then the planet, only a little over 5,000 miles distant, would appear in the sky as a huge moon, and would undergo phases from new to crescent, then half, then gibbous and finally full, returning to the new phase in the reverse order. As Phobos presumably has no atmosphere, the sky would remain constantly dark, and the sun and stars would be seen at the same time. The sun would appear a little smaller than from the earth, but the groups of stars would bear the same configuration that they have for us.

It is to the artistic ability, aided by the scientific knowledge, of Howard Russell Butler, N. A., that we are indebted for this imaginative view. Our cover is reproduced from one of two views of Mars from Phobos that Mr. Butler has painted, through the courtesy of Dr. Clyde Fisher, curator of astronomy at the American Museum of Natural History.

Science News-Letter, May 4, 1929

The new members of the academy are Dr. Roger Adams, professor of organic chemistry at the University of Illinois; Irving W. Bailey, associate professor of botany, Bussey Institution, Boston; Dr. A. F. Blakeslee, botanist at the Carnegie Institution's station for experimental evolution at Cold Spring Harbor, N. Y.; Dr. James B. Conant, associate professor of chemistry, Harvard University; Dr. Bergen Davis, professor of physics at Columbia University; Dr. C. J. Davisson, physicist at the Bell Telephone Laboratories, New York, whose recent work in proving the wave nature of electrons has been hailed as one of the most important advances in physics; Dr. Joel H. Hildebrand, professor of chemistry at the University of California, Berkeley; William Hovgaard, Danish-born pro-

fessor of naval design at the Massachusetts Institute of Technology; Dr. Albert W. Hull, research physicist at the General Electric Company's Research Laboratory at Schenectady, N. Y.; Frank Leverett, geologist of the U. S. Geological Survey and lecturer in glacial geology at the University of Michigan, Ann Arbor; Dr. Paul W. Merrill, astronomer at the Mt. Wilson Observatory, Pasadena, Calif.; Dr. David H. Tennent, zoologist at Bryn Mawr College, Pennsylvania; Dr. George H. Whipple, dean of the School of Medicine and Dentistry and professor of pathology at the University of Rochester, N. Y.; and Dr. Clark Wissler, curator of ethnology at the American Museum of Natural History, New York, and professor of anthropology in the Institute of Psychology at Yale.

Science News-Letter, May 4, 1929

In This Issue—

New Academicians, p. 271—Ancient Modern Birds, p. 272—The President Receives a Medal, p. 272—Substitute for Diabetes Cure, p. 272—When the Sun Disappears, p. 273—99 Years Young, p. 275—Trial and Error, p. 277—Conquering a Plague of Childhood, p. 277—Corporation Medicine, p. 277—Mercury soon Visible, p. 279—The Radio Roof, p. 281—Bullheads, p. 281—Save Indian Relics! p. 281—Books, p. 283—And More Books, p. 284.

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Each article is automatically *dated* by its last line.

All of the resources of Science Service, with its staff of scientific writers and correspondents in centers of research throughout the world, are utilized in the editing of this magazine.

INTRODUCING NINE OF THE NEW ACADEMICIANS



ROGER ADAMS



IRVING W. BAILEY



BERGEN DAVIS



C. J. DAVISSON



JOEL H. HILDEBRAND



ALBERT W. HULL



PAUL W. MERRILL



DAVID H. TENNENT



CLARK WISSLER

Not Pictured—A. F. Blakeslee, James B. Conant, William Hovgaard, Frank Leverett, George H. Whipple.

New Sugar

Chemistry

Something new under the sun, a form of sugar that does not occur in nature, has been artificially put together by Edna Montgomery and Dr. C. S. Hudson, of the U. S. Public Health Service. Miss Montgomery and Dr. Hudson used common milk sugar as their raw material, and by treatment in an alkaline medium obtained a substance analogous in structure with common table sugar, but having a different chemical nature. They call their new product lacto-ketose.

At the same session Dr. Hudson and Eugene Pacsu, a Fellow of the International Education Board, announced that they had succeeded in crystallizing turanose, a rare sugar which has never before been secured in a wholly pure form.

Science News-Letter, May 4, 1929

Hoover Given Medal

Engineering

President Herbert Hoover received the highest award of the engineering profession when he was presented the John Fritz Gold Medal for 1929 on Thursday, April 25.

Four leading engineering societies, the American Societies of Civil, Mining and Metallurgical, Mechanical and Electrical Engineers, joined in awarding the medal annually for "notable scientific or industrial achievement without restriction on account of nationality or sex". President Hoover was awarded the medal tentatively and without announcement in October, 1927, while he was still Secretary of Commerce.

Science News-Letter, May 4, 1929

Liver Seen as Insulin Substitute

Medicine

Liver, which is now being used extensively as a cure for anemia, may become a substitute for insulin in the treatment of diabetes, it appears from studies made at the Peter Bent Brigham Hospital by Dr. Harry Blotner and Dr. William P. Murphy. Dr. Murphy with Dr. G. R. Minot developed the liver treatment for pernicious anemia. In the study just reported, Drs. Blotner and Murphy found that liver contains a substance that will reduce the sugar concentration of the blood as insulin does.

Liver has been heretofore excluded from the diet of persons suffering from diabetes, because liver contains glycogen, a carbohydrate which may be turned into sugar in the body. In

Modern Birds in Times of Mastodons

Paleontology

Modern species of birds flew over the backs of beasts long since extinct, far back in the Ice Age, in the marshes of what is now Florida. A great collection of bird bones, only recently unearthed and not all of them yet received in Washington, was reported before the meeting of the National Academy of Sciences in Washington by Dr. Alexander H. Wetmore of the Smithsonian Institution.

The bones were found not far beneath the surface of the ground, near the town of Vero, where sensational fossil finds a few years ago hinted at the possible existence of man on this continent during the Ice Age or very soon after its close. Most of the bird bones, being delicate, were broken, but Dr. Wetmore has been able to identify 48 species by a careful examination of the fragments.

Most of the birds are of species that fly over Florida, though a part of the collection consists of birds that have never been seen in the state in modern times. They were associated with the bones of extinct mammals, such as mammoths, tapirs,

ancient horses and glyptodonts or giant armadillos.

Since the bone bed from which they were taken shows indications that it was an ancient marsh, it is natural to find many swimming and wading birds, such as ducks, geese, spoonbills, herons, grebes, a large stork now known mainly from South America, and the nearly extinct whooping crane.

One of the most interesting finds consisted of bones that belonged to a condor. At present only two species of condor are known, one in the California mountains and one in the Andes of South America; they are the largest birds that fly. The Florida specimen appears to be identical with the California condor, except that it was larger.

Another extraordinary bone was a broken piece of the shank of a long-departed turkey-gobbler, with three spurs instead of the customary one. European birds with multiple spurs have been reported, Dr. Wetmore said, but this is the first instance on record of a three-spurred American turkey.

Science News-Letter, May 4, 1929

Radio over Telephone Line

Radio

The perfection of a form of radio transmitted over telephone wires and called the monophone was announced by Gen. George O. Squier.

Calling attention to the crowding of the radio lanes in space, Gen. Squier advocated the application of

currents of radio frequency to the millions of telephones in use in this country. Without interfering with the present point-to-point service and without change in equipment, the telephone wires could be made to work sixteen hours a day bringing various programs into the home.

Making this line radio or wired wireless a part of the telephone service would provide a method of support that would eliminate the necessity of the paid advertising of radio broadcasting.

Low power used in the transmitting is another advantage claimed for the system. Fifty watts would supply 5000 telephones. No tuning would be necessary when operating the telephone-connected set, as the mere turn of a switch would give a different program. Static, fading and other sorts of interference would be eliminated. Television and sound motion pictures will enter the home by his system, Gen. Squier predicted. Utilization of wired radio for educational purposes was urged.

Wired wireless, which was the early name of the monophone, was patented by Gen. Squier in 1910.

Science News-Letter, May 4, 1929

Astronomers Prepared for Eclipse

By JAMES STOKLEY

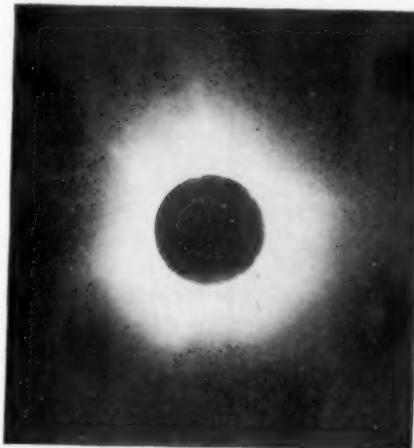
If you should happen to be at Iloilo, second largest city of the Philippines, at 3:27 p. m., on next Thursday, May 9, you will not be able to see the sun in the sky for a few minutes. Perhaps it will be cloudy there at the time, but even if it is clear, the sun will disappear.

In the darkened sky, the planet Jupiter will shine brilliantly just above where the sun was when the light went out. Still higher, not quite so bright, is seldom-seen Mercury. Below, brightest of all, is Venus, brilliant evening star a few months ago. High in the eastern sky is Mars, inferior in brightness to its planetary brothers and sisters. The bright stars will flash out as well.

But most striking of all, to one fortunate enough to be over there next Thursday afternoon, is the appearance of the sun. Where the sun itself would be seen, is an intensely black disc. Shining out around it is a pearly white halo, irregular in shape, perhaps with several long streamers. Close to the black disc, there may appear several brilliant spots of red light.

Not for long does the glorious spectacle continue. After three and a half minutes a brilliant spot of light of the sun reappears, and about an hour later the sun is gradually sinking in its accustomed manner into the west, as if nothing extraordinary had occurred.

If you happen to be on the Iloilo grounds of the Philippine railway at



THE LAST ECLIPSE, on June 29, 1927, photographed at Jokkmokk, Lapland, by a party from the Hamburger Sternwarte, Germany

this time next Thursday, however, you will not find any astonishment at this remarkable occurrence. All around you will be a group of men with curious instruments, working with feverish activity during the three and a half minutes it lasts. All is quiet, except for the monotonous chant of one of the party, standing over a chronometer, as he counts seconds:

"One, two three, four, five, six, . . ." and so on up to two hundred and twenty or so.

The cause of this activity is one of the rarest, grandest and most important of natural phenomena—a total eclipse of the sun. So important is it that astronomers are glad to travel

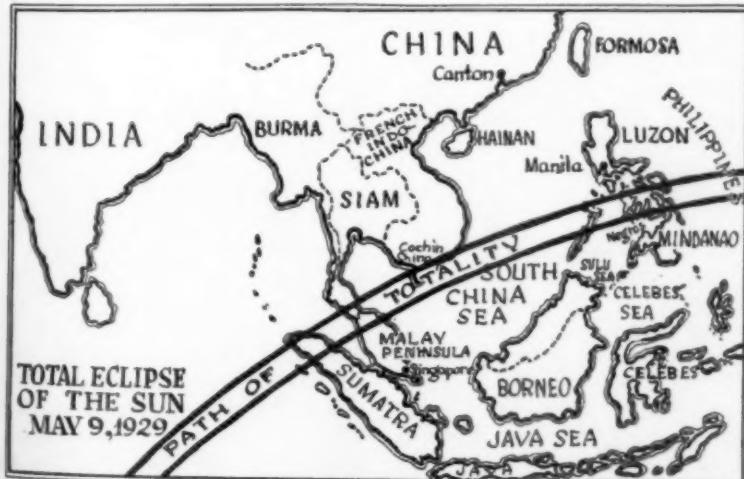
half-way around the earth, if necessary, to see one—and to take a chance on the weather being cloudy at the crucial moment, and making the long months of preparation and travel all in vain.

In many ways this coming eclipse will be one of the best in years. At Iloilo is a party of astronomers from the U. S. Naval Observatory in Washington. Nearby is a group from England. Farther west is a party from the great Hamburg Observatory in Germany. In Cochin-China, on the Malay Peninsula, in Siam, and in Sumatra, are other groups. One is from Swarthmore College, near Philadelphia. Another is from Harvard University. Several other parties from observatories in England, Germany and Holland, together with thousands of amateur star-gazers, or photographers turned star-gazers for the occasion, will be shooting away with their cameras to obtain a permanent record of the few minutes when the sun disappears.

All this because the moon happens to be of the size and at the distance that it is. If it were a little smaller, or a little nearer to us, we would never see an eclipse, and its glories would be unknown to us.

The moon, like the earth, and all the other planets in the solar system, is lighted by the sun. If the space between the planets were dusty, we could see a long shadow trailing out into space from the moon and each of the planets, always traveling along with the planet, and keeping pointed away from the sun. In one way, such a planetary shadow would differ from many of the shadows that we are used to. If you stand in a dark room, holding a candle, the shadow cast on the wall back of you is much larger than you are. This is because the source of light is much smaller than the object casting the shadow.

Suppose that the light is coming from a fixture with a large, round, translucent glass globe. Underneath it you hold your hand, and below your hand you hold a piece of white paper. When the paper is directly below your hand, the shadow is almost full size. As you move the paper farther away, the shadow becomes smaller and smaller, and finally you get to a point at which no clear shadow is seen. In other words, the light source is now larger (Turn to next page)



WHERE THE COMING ECLIPSE WILL BE SEEN. Practically all of the land areas shown in the map as being crossed by the path of totality will have their quota of astronomers

Astronomers Ready for Eclipse—Continued

than the object casting the shadow, and so the shadow is a cone.

The sun is larger than any of the planets, so their shadows are all conical, with the tips of the cones pointing away from the sun. The shadow of the moon is about 232,000 miles long. The distance of the earth from the moon is just about the same figure. At least twice each year the shadow touches the earth. As the earth is always close to the tip of the conical shadow, it is never very large. But if the shadow strikes the earth obliquely, it may be spread out into an ellipse, which may be longer than this in one direction.

The moon travels on one trip of its orbit around the earth every twenty-eight days, but generally the shadow misses the earth. Twice every year at least, occasionally as often as five times, the shadow touches the earth, and sweeps across its surface at speeds as great as 5,000 miles an hour. The path traced by the shadow is usually about a hundred miles wide and many thousands of miles long.

To a person in this path, as the shadow approaches, the dark disc of the moon is seen gradually to encroach on the bright sun, so that after a few minutes it looks like a cookie out of which someone has taken a rather timid bite. The bitten-away part increases in size. Perhaps an hour after the first contact of moon and sun, the latter is completely swallowed up, and the beautiful corona flashes out for a brief period. Then a spot of the sun reappears, and the moon disgorges its solar cookie, in the reverse order from that in which it swallowed it.

Not every eclipse is a good one from the point of view of the astronomer. Sometimes the shadow strikes a part of the earth that is completely inaccessible. Sometimes the eclipse is so extremely brief that the astronomer does not feel that it is worth the trouble. Or sometimes the chances for clear skies at accessible places along the path may be so poor that he is unwilling to take a chance. Sometimes, also, the tip of the shadow does not quite reach the earth's surface and the result is an annular eclipse. Then the bright disc of the sun never completely disappears, but remains as a ring of light around the dark moon. Such an eclipse will occur later this year, on November 1, but it is of little scientific value, and no astronomer will go out of his way to get to Africa, where it will be visible.

Before this month, the last chance that astronomers had to observe an eclipse of the sun was on June 29, 1927. The path crossed England, Norway, Sweden and part of Siberia. At no point did the total phase last more than 50 seconds. Only two of the many groups of astronomers that went to observe it, one at Giggleswick, England, and the other at Jokkmokk, in northern Sweden, had clear weather.

Before that, there was another eclipse visible in the Indian Ocean and Sumatra, Borneo and Mindanao, on January 14, 1926. This was quite favorable. Fine weather was the order of the day, and a number of good photographs were made.

This eclipse was preceded, on January 24, 1925, by the famous New England eclipse, which was observed by an estimated total of 20,000,000 people. Along the Atlantic seaboard, where there seemed so little chance of clear weather in the early morning in January, the day dawned clear and cold, and most of the observing parties were successful.

There was no favorable eclipse in 1924, but on September 10, 1923, the path of one crossed southern California and Mexico. California's weather, as usual, was unusual, and cloudy weather prevented satisfactory observations. Farther south, in Mexico, the weather was clear, and observations there were successful.

September 21, 1922, brought a very favorable eclipse, visible in Australia, and a couple of small islands in the Indian Ocean.

On the 29th of May, 1919, there was a very famous eclipse visible in Brazil. It was at this eclipse that Prof. A. S. Eddington, of Cambridge University, England, first confirmed the deflection of star light near the sun, as predicted by Einstein's relativity theory, and so brought that theory into general prominence. The year before, on June 8, 1918, the path of an eclipse crossed the western United States.

With but seven total eclipses in the last ten years, visible only in widely scattered parts of the world, none lasting more than a few minutes and one lasting less than a minute, the rarity of the event can be realized. If an astronomer went to all the eclipses visible during his lifetime, and had clear weather at every one, he would only see the sun eclipsed for about half an hour, in spite of the hundred thousand or so miles that he would have to travel.

There are four prominent American eclipse observers, each having been to six or more eclipses. These are Prof. W. W. Campbell, of the University of California; Prof. H. D. Curtis, of the University of Pittsburgh; Prof. John A. Miller, of Swarthmore College, and Prof. S. A. Mitchell, of the University of Virginia. Campbell and Curtis each have been to eight eclipses and are tied for first place. Dr. Campbell is now President of the University of California and will not go to Sumatra, so that after this eclipse, Prof. Curtis will be ahead in the number attended. Prof. Mitchell ranks second with seven eclipses and Prof. Miller has six to his record.

However, the batting average of these observers has not all been 100 per cent. Only Prof. Miller has had clear weather at every eclipse he attended. Prof. Mitchell has had cloudy weather once, at the 1927 eclipse in Norway, when the sky was completely overcast. Thus, he has also seen six. Prof. Campbell has had cloudy weather twice and has seen six eclipses. Three eclipses that Prof. Curtis attended have been cloudy so he has seen only five, but should the one in Sumatra be successful, then he will have seen as many as Professors Campbell and Mitchell, but Prof. Miller will then advance to first place for having seen seven.

But why are the astronomers so anxious to see eclipses? Why have the numerous expeditions from some half-dozen countries traveled to Sumatra and the Philippines to see the eclipse next Thursday?

Of all the stars in the sky, the most important one to us is the sun. After all, the sun is a star, just like any other star in the sky. The only reason that it looks different to us is because it is so much closer than any other. Since it is the sun that is the source of all the energy that we use on the earth, the very energy that keeps the human race alive, it is essential that the sun be studied in every way possible. And further, as the sun is a typical star, and the only star of which we can get a closeup, its study helps us to learn of the behavior of the more distant stars that we cannot study so well.

The corona, outermost layer of the sun, extends for a million or more miles from the solar surface, and can only be adequately observed at the time of an eclipse. This is because its light is only about half as bright as that of the (Turn to next page)

Astronomers Ready for Eclipse—Continued



AT A COLDER ECLIPSE. Prof. Heber D. Curtis, of the Allegheny Observatory, Pittsburgh (left) and Prof. John A. Miller, of Swarthmore College, Pa., at the eclipse of Jan. 24, 1925, which they observed from New Haven, Connecticut, with the temperature around zero. The two astronomers are again together for an eclipse in a somewhat warmer climate.

full moon, and about a millionth as bright as the sun itself. Ordinarily, the glare of the sun in the surrounding atmosphere makes it invisible.

At the station of the Naval Observatory, on the Philippine Railway grounds at Iloilo, several important observations will be made. With a camera 65 feet long, photographs will be made of the inner layer of the corona. In Sumatra, Prof. J. A. Miller, of Swarthmore, will make similar photographs with an identical camera. The shadow of the moon sweeps across his station about an hour before it reaches Iloilo, so that comparison of the two pictures should reveal how rapidly the material in the corona is moving.

It is known that the corona consists mostly of scattered sunlight, scattered partly by fine particles, or dust, and partly by the molecules of gas. But nobody knows just how fast it is moving. Obviously it is moving, for eclipses at different times have coronas of greatly different shapes. When an eclipse occurs at the time of a large number of sunspots, a condition occurring every eleven years, the corona is nearly circular, extending out an equal distance on all sides of the sun. At the time of few or no sunspots, the corona shows long streamers extending out from the

equator of the sun. The sunspot maximum came last year, and the sunspots are now definitely on the decline. Probably the corona will be nearly the same as that of the 1918 eclipse, for in that year also the sunspot maximum had gone by just a year before.

Another way of telling of the constitution of the corona is with the spectrograph, which analyses the light. Prof. Heber D. Curtis, of the Allegheny Observatory, who is with Prof. Miller, will make such spectrum photographs of the corona. He is not using the ordinary kind of spectrograph, however, but one which makes use of the interference of light and gives extremely accurate measurements of the speed of the moving material in the corona.

Within the corona, the outer part of the sun as we see it, is the chromosphere, a layer of glowing gases. Ordinarily, this makes itself evident only by absorbing part of the light from the inner parts of the sun, and causing the dark lines in the color spectrum. At the time of an eclipse, just before and just after the moon completely covers the sun, this layer shines by its own light. Its spectrum then is a series of bright, colored arcs of light, and by their measurement on the photographs it is possible to meas- (Turn to next page)

Prehistory Young Science *Archaeology*

The science of determining what went on in the world before men started the writing of history is just ninety-nine years old. Dr. George Grant MacCurdy, of Yale University, reminded the American Philosophical Society at its Philadelphia session.

The zero milestone of the science of prehistory was set by C. J. Thomsen of Copenhagen in 1830 when he established a system of chronology for prehistoric ages based on the development of human industry in stone, iron, and bronze.

The years 1857 to 1861 were important ones. The discovery of primitive human bones at Neandertal, Germany, was announced in 1857. The following year came the joint communication of Darwin and Wallace regarding the perpetuation of varieties and species by means of natural selection. In 1859, Darwin's "Origin of Species" was published. The same year scientists agreed that the crudely chipped stones found along the valley terraces of the Somme River must have been made by men of remote antiquity, and soon after that came the realization that a reindeer bone with pictures of wounded animals cut into it was really a specimen of the art of ancient men.

"Before the science of prehistory could be developed it had to await the prior development of geography and geology as well as comparative anatomy," Dr. MacCurdy stated. "It was a bit of great good fortune that the discovery of the human bones at Neandertal did not take place during the Middle Ages."

One of the big problems of prehistory is to gain an increase of knowledge regarding ancient man in Asia and Africa in order that Old-World prehistory as a whole may be correlated, Dr. MacCurdy stated. To this end, he said, the American School of Prehistoric Research has obtained permits and is already exploring and excavating jointly with the British in Iraq and Palestine. Another great problem is the correlation of human remains with the various phases of the Ice Age.

Science News-Letter, May 4, 1929

Twenty-five years ago, the first flight in a heavier-than-air machine lasted 59 seconds.

Alaska has a herd of galyaks, which are hybrids of galloway cattle and the Tibetan yak.

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Eclipse—Continued

ure the exact height of each of the gases in this solar atmosphere.

It was in the 1919 Brazilian eclipse that the deflection of the light of a distant star as it passes close to a body so massive as the sun was first shown. This had been predicted by Prof. Einstein, and when it was found his theory of relativity came into world-wide prominence, despite the fact that it was so technical. Prof. W. W. Campbell, of the University of California, also measured it, but some opponents of the theory of relativity have questioned both measurements, and it should be shown again. Prof. Miller will make photographs to reveal it.

These are but a few of the researches that have brought several hundred astronomers to Malaysia to wait anxiously for next Thursday, hoping and hoping that the weather will be good and their efforts not in vain. Some have already been at their stations for months, getting their instruments ready. Now practically all construction work is finished, but their time is not idle. Dozens of rehearsals are being held, and will be held up to zero hour next Thursday. With so much depending on what can be done in a very few minutes, everyone must know just what to do at the right time. As one member of the party counts seconds, another inserts the plates in the camera, another opens the lens. The lenses are covered, plates removed, other plates inserted.

If the weather should be cloudy the astronomers will be disappointed, of course. But they will waste no time in vain regrets, for they are good sportsmen, and realize full well the chance they are taking. And there will be another eclipse, visible in Canada and New England, on the afternoon of August 31, 1932, for which preparations will soon begin.

Science News-Letter, May 4, 1929

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"Trial and Error" is Method of Nature

Psychology

Look at a bright spot and hold your eyes as steady as you can. Continually your eyes are shifting slightly, constantly readjusting themselves to keep the spot in view.

This process, called "approximation and correction," was advanced by Dr. Raymond Dodge, Yale psychologist, speaking before the National Academy of Sciences, as a fundamental pattern of life, whether it be conscious intellectual endeavor by human beings or semi-automatic movements of lower animals.

"Trial and error" is recognized as a convenient method of ordinary life used by everyone unwittingly or con-

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Aviation

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Eclipse—Continued

ure the exact height of each of the gases in this solar atmosphere.

It was in the 1919 Brazilian eclipse that the deflection of the light of a distant star as it passes close to a body so massive as the sun was first shown. This had been predicted by Prof. Einstein, and when it was found his theory of relativity came into world-wide prominence, despite the fact that it was so technical. Prof. W. W. Campbell, of the University of California, also measured it, but some opponents of the theory of relativity have questioned both measurements, and it should be shown again. Prof. Miller will make photographs to reveal it.

These are but a few of the researches that have brought several hundred astronomers to Malaysia to wait anxiously for next Thursday, hoping and hoping that the weather will be good and their efforts not in vain. Some have already been at their stations for months, getting their instruments ready. Now practically all construction work is finished, but their time is not idle. Dozens of rehearsals are being held, and will be held up to zero hour next Thursday. With so much depending on what can be done in a very few minutes, everyone must know just what to do at the right time. As one member of the party counts seconds, another inserts the plates in the camera, another opens the lens. The lenses are covered, plates removed, other plates inserted.

If the weather should be cloudy the astronomers will be disappointed, of course. But they will waste no time in vain regrets, for they are good sportsmen, and realize full well the chance they are taking. And there will be another eclipse, visible in Canada and New England, on the afternoon of August 31, 1932, for which preparations will soon begin.

Science News-Letter, May 4, 1929

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"Trial and Error" is Method of Nature

Psychology

Look at a bright spot and hold your eyes as steady as you can. Continually your eyes are shifting slightly, constantly readjusting themselves to keep the spot in view.

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Aviator Must Look—*Con.*

how these noises can be converted to a pilot's benefit. Then again, you may say you can listen to the radio signal for your direction finding, and so forth, and this is, of course, true, but even in this case the trend of design is to make the radio beacon signals visible on the instrument board rather than audible.

So your hope lies in looking. Blind flying, that is, flying under conditions where visibility is almost zero due to fog or darkness, is possible and is quite a regular thing, but it is always necessary to make a landing. And landings under these conditions are dangerous, if not impossible. The pilot must have some visual assistance to bring him into an airport.

This is the reason that such a widespread movement is afoot to persuade all communities to paint the name of their town and other markings on a conspicuous building. Only those who have flown much and who have been lost at times can appreciate the value of such things. And as a general rule, when the weather gets so thick, or the darkness so dark that you cannot see where you are going, probably the safe thing to do is to turn around before it is too late.

So, in the air, instead of Stop! Look! and Listen! it is Look! Look! and Look! and if you can't Look! Look Out!

Science News-Letter, May 4, 1929

The mummy of the Egyptian Pharaoh Amenophis III, called the magnificent, shows that in his last years he suffered from two badly abscessed teeth.

A statistician says that "liability to appendicitis in this country is unquestionably increasing, and in all probability as the result of faulty dietary habits."

Poliomyelitis Conquest—*Continued*

Rockefeller Institute, have studied the disease with monkeys, the only other animals subject to the disease, as their experimental aids.

Most hopeful for use in treatment and prevention of infantile paralysis is convalescent serum, which can be obtained from man or monkey two months to forty years after recovery from the disease. The unfortunate victim thus profits from a successful fight waged against the disease months or years before. Protective substances are thus imported into the ailing body to reinforce its own defenses.

Unfortunately the serum from mon-

"Trial and Error"—*Continued*

rhythm of the object's movement, always correcting their minor errors from time to time.

"The eyes sometimes act like a smart aleck by anticipating the object's movement," Dr. Dodge explained.

Dangling a piece of meat before the eyes of his dog trained not to snap for it, Dr. Dodge discovered that if the meat was moved back and forth fast enough the dog's eyes gave up the attempt to follow the oscillations of the tempting morsel. In mental diseases, such as precox and paranoid cases, the unfortunate individual gets into a similar situation with regard to his whole life, Dr.

Oldest Records—*Cont'd*

layer on the bottom. Each year is represented by one of these composite layers, grading from coarse in the spring to fine-grained in the fall.

Naturally, a year of heavy rains would build a thicker layer than a year of drought when the streams flowed thin and clear, so that it is possible by counting back on these sheets of varve clays to tell what the weather was like 10,001 or 10,002 years ago, almost as well as though it were only one or two years ago. The varve clays have shown that the last of the glaciers in northern Europe melted about 6500 B. C.

A second kind of natural weather record has been found in the annual rings of California big trees and other old trees. Although these records are not nearly so old as those written in the clays, they carry the weather reports back beyond the beginning of the Christian era, telling of years of rain or years of drought and fire by the thickness of the annual layer of wood laid down in their trunks.

Science News-Letter, May 4, 1929

keys cannot be used in human beings in the case of this disease, although in the case of other ills horses and other animals can be used to manufacture the protective substances.

Within the last month, Dr. Flexner announced, there has been discovered in his laboratories a new method of introducing the convalescent serum into the spinal fluid at the base of the skull with the result that the development of the disease is prevented. So far this new technique has been applied to monkeys only, but the next step is clinical use.

Science News-Letter, May 4, 1929

Dodge suggested. The speed of the surrounding world becomes too fast, the individual quits trying to keep up and takes refuge in fancies and delusions. This suggestion is further supported by tests on such cases that show that their eye movements are not more jerky and less accurately adjusted than those of normal people.

Approximation and correction rule all biology, Dr. Walter B. Cannon, of Harvard, declared in supporting Dr. Dodge's contention. If a patient's temperature is taken frequently a steady fever will be found to vary slightly back and forth.

Science News-Letter, May 4, 1929

Medicine—*Continued*

the physician's services, but a place where people of little means could find treatment at a price within their means. Physicians as a class generously give their services free to thousands who cannot pay for medical treatment. But they believe that the great clinics, whether operated by private individuals or large corporations for the benefit of their employees, are taking patients and hence a living from the physician who practices individually.

As far as advertising goes, physicians advertise themselves as a class through their organization, the American Medical Association. This association publishes a popular health magazine which invariably advises the public to consult physicians in cases of sickness or injury. The editor of the *Journal of the American Medical Association* contributes many articles to magazines and writes a column of daily health advice for newspapers. He also recommends consulting a physician for the treatment of the various ills of which he writes. This advice is given in good faith, possibly with no selfish motive. Certainly it is excellent advice, for one should consult a trained physician in case of illness. But indirectly it is large-scale advertising of the medical profession as a whole.

The matter is not one of ethics alone. It is an economic problem. The cost of medical care to people of moderate means and the cost of a physician's training and subsequent living need to be adjusted to the satisfaction of both groups. The action taken by the Chicago Medical Society involves this question, as well as the question of unprofessional advertising by physicians.

Science News-Letter, May 4, 1929

Seldom-Seen Mercury in May Skies

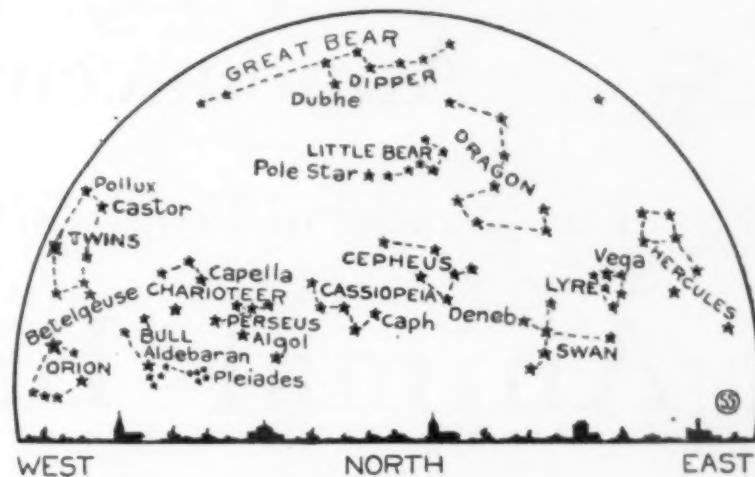
Astronomy

Compared with the magnificent spectacle of a total eclipse of the sun, the evening sky in May has little scheduled that is of great importance. The planets Venus and Jupiter, which were so prominent in the west after twilight a month or two ago, have now passed to the neighborhood of the sun and are no longer visible. Mars is still present in the sky, however, and in the middle of the month sets about midnight. It is visible in the southwest during the evening, in the constellation of Cancer, the crab. Saturn, the ringed planet, now rises about 10 P. M. It appears in the late evening as a pale yellow star of the first magnitude between the constellations of Scorpio, the Scorpion, and Sagittarius, the archer.

There is one rarely visible planet, however, that can be seen this month. It is Mercury. So seldom does this get into a position for seeing, that even the great Copernicus who first showed the world that it was a member of the solar system and, together with the earth, revolving around the sun, is said never to have seen it.

Mercury is only 36,000,000 miles from the sun, as compared with 67,000,000 miles for Venus and 93,000,000 miles for the earth. The result is that usually it is so close to the sun that it is completely lost in the brilliant glare. It revolves around the sun once in 88 days. That is to say, its year is equal to 88 days on the earth. However, as it moves, the earth also moves, so that every 116 days it comes between the sun and the earth.

Once in this 116 day period, we see



it to the east of the sun and once to the west of the sun. When to the east, as it is now, the sun sets first, leaving Mercury visible in the evening low in the western sky. At such times, it is said to be the evening star. When on the western side of the sun, it rises before sunrise and is then seen low in the east in the morning, as the morning star.

This month Mercury is at the greatest distance east of the sun, or at greatest eastern elongation, as the astronomer calls it, on May 15. On that date it sets about two hours after the sun and is visible about 20 degrees above the horizon at sunset. Twenty degrees is about half the distance between Regulus, the bright star at the end of the sickle in Leo, in the southwest, and Pollux, the brighter of the two twins, low in the northwest. For about a week before and after this date, Mercury can be seen

as a bright star, low in the western sky at dusk. It should not be difficult to pick it up with the naked eye, but a pair of opera glasses or binoculars may help in locating it. When one once knows where to look for it, it can be easily seen.

Nine first magnitude stars are now in the sky. Regulus, at the end of the handle of the sickle in Leo, the Lion, is one of these, and so is Pollux in Gemini, the twins. Procyon, in Canis Minor, the Little Dog, is low in the west. Capella is in Auriga, the charioteer, low in the northwest. In the southern sky is the bright star Spica, in Virgo, the Virgin. High in the southeast is Arcturus, in Bootes, while low in the southwest is Antares, in Scorpio, the Scorpion. Low in the northwest is Vega, in Lyra, the Lyre, and still lower is Deneb in Cygnus, the Swan. By next month these latter stars will have risen higher in the sky while those in the west will have disappeared from view. Then the summer skies will again be with us.

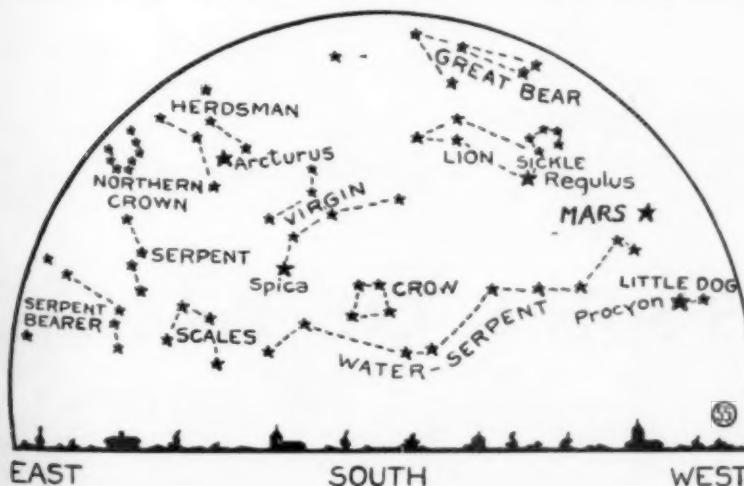
Science News-Letter, May 4, 1929

Yale Gets Brains

Neurology

An unusual collection of brains is coming to Yale for study. They are the brains of fishes, duplicate specimens in the collection of Harry Payne Bingham now housed in the Peabody Museum, and they are destined for dissection and examination as a part of the wide program of the new Institute of Human Relations. A fund of \$5,000 a year, over a period of five years, has been guaranteed for the support of these studies by Mrs. Dudley S. Blossom of Cleveland.

Science News-Letter, May 4, 1929



HOLD THESE MAPS in front of you and face North or South. The upper or lower one will then show the stars of the May evening sky

Announcement

Two New and Progressive Textbooks

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By DAVID MYERS MOTTIER

Professor of Botany and Head of the Department, Indiana University

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PHILADELPHIA

Hunting for "Radio Roof"

Radio

They are hunting for the "radio roof of the world" with echoes. Somewhere out in the borderlands of the earth's atmosphere there is a layer of electrically charged gas particles that keeps radio waves from dissipating themselves into space and makes long-distance radio signalling possible. It is called the Kennelly-Heaviside layer, in honor of the scientists who discovered it. It fluctuates a great deal either in its height above the earth or in its power to reflect radio waves, and hence makes a lot of trouble for radio men.

To learn more about the location and behavior of this important layer, Dr. M. A. Tuve and L. R. Hafstad of the Carnegie Institution of Washington have been studying short-wave radio waves sent out by the U. S. Naval Research Laboratory, which strike the layer and are reflected back, like echoes from a wall. The same principle is used in the sonic depth-finding employed by ships

to study the bottom of the ocean. They laid their results before the meeting of the American Geophysical Union in Washington.

The work of other men who reach into the outer atmosphere with the fingers of their minds was reviewed by Commander N. H. Heck of the U. S. Coast and Geodetic Survey, and Dr. E. O. Hulbert of the U. S. Naval Research Laboratory. There are two theories regarding the cause of the aurora borealis, or northern lights. One is that the rarefied gases in the upper atmosphere are excited and caused to glow by the action of ultraviolet light bombardments from the sun, and the other that the effect is produced by streams of electrons shot out from the same source. Since high-air Arctic exploration by Zeppelin is contemplated during the coming year, these questions have assumed unusual importance at this time.

Science News-Letter, May 4, 1929

Urge Saving Indian Records

Archaeology

The preservation of irreplaceable earth monuments built by Indians in middle western America long before the white man came will be urged at an archaeological conference called for May 18 at St. Louis, under the sponsorship of the National Research Council.

Plows, steam shovels, and souvenir dealers are destroying forever the tombs and buried records of an ancient civilization that built pyramids that rival those of ancient Egypt, Dr. Knight Dunlap, chairman of the division of anthropology and psychology, declared.

"Once the states and local communities of the Mississippi valley realize the value of these valuable heritages from the past they are sure to take steps to protect them properly," Dr. Dunlap said.

Governor Henry S. Caulfield of Missouri will open the May 18 conference and among the many speakers there will be Dr. Wm. John Cooper, U. S. Commissioner of Education, and Dr. M. W. Stirling, chief of the U. S. Bureau of American Ethnology.

Many wild theories have been advanced to account for the Mound Builders. Today the scientists agree that they were American Indians, but this makes them none the less interesting, for in their monuments they have left us a record of the development

of an American civilization.

"Our scientists are making rapid progress in this study of the lives of the prehistoric inhabitants of America, but they need all the materials they can get," Dr. Dunlap said. "Still the work of destroying the mounds and other remains of our predecessors goes merrily on. Farmers plow the mounds down to make simple the tilling of their fields. Tourists dig into them in the hope of getting arrowheads. Some have even been blown up with dynamite. Dealers in souvenirs exploit them indiscriminately. In one county of Illinois there are 655 mounds and all but 50 have been looted. The contents have been scattered and valuable historical 'documents' have been forever lost.

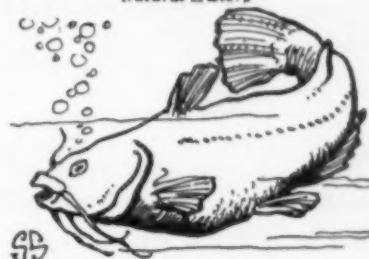
"Most of this destruction has been done in ignorance of the fact that the trinkets are of no value scientifically (and of very small value in any other way), unless accompanied by a careful record of the details of excavation by which they are obtained. It is the total picture of the position and arrangements of objects in the mounds that reveals important facts to the scientists. This is all lost when amateurs and pot hunters rifle the sites, moving and breaking the tell-tale reminders of an ancient housekeeping."

Science News-Letter, May 4, 1929

NATURE RAMBLINGS

By FRANK THONE

Natural History



"Bullheads"

Trout fishing isn't very good yet, though whether that is the fault of the reluctant trout who will not take the fly, or of the reluctant angler who will not take the fly to the trout, may be a question. But as soon as the ice is out of the river the small boy goes hopefully to the pursuit of the catfish, with his can of worms or chunk of liver. And sometimes he brings home the bullhead.

There are numerous species of catfish, but they are all alike in several respects. They are all naked; that is to say, scaleless; they all have rather a preference for loafing about on the bottom, and the muddier the bottom the better they like it; they all have long, pendulous whiskers, like Kublai Khan, and like the Khan they all have an insatiable tendency to gobble up everything in sight. That is what makes them so easy to catch; they have more appetite than judgment.

The particular use for those long whiskers has never been learned for certain; despite his large mouth, the catfish is a secretive creature. It seems likely, however, that they are special organs of touch, useful to the fish when he goes rooting about in the bottom mud up to his eyes, shoveling for buried worms and other tidbits. In some instances, however, it is perfectly well established that they have use as weapons, or that the sharp spines associated with them have such use. The small boy who has had to struggle with a catfish to recover a swallowed hook can testify to that.

Science News-Letter, May 4, 1929

To Help Scientists

General Science

Sigma XI, the society for the promotion of research, is now on its annual hunt for scientists who need financial help in their studies. Grants ranging from \$100 to \$1000 are available without restriction as to where the work is done.

Science News-Letter, May 4, 1929

THE INSECT WORLD

What clumsy giants we must appear to the darting dragon-fly or the laboring bee! Wonderfully interesting is the life of the beetle, the ant or even the despised fly.

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FIRST GLANCES AT NEW BOOKS

SOCIAL LIFE OF THE ANTS— Auguste Forel—*Albert and Charles Boni* (\$15). These two beautifully illustrated volumes are probably destined to remain one of the classic works on ants. They sum up a century of entomological research and constitute a lasting monument to the widely discredited fact that charm of expression does not have to be sacrificed to scientific accuracy. The wealth of detail that makes this work invaluable to the myrmecologist makes it no less delightful to any amateur naturalist who takes joy in all living things.

Entomology
Science News-Letter, May 4, 1929

MIDDLETOWN—Robert S. and Helen Merrell Lynd—*Harcourt, Brace* (\$5). This book is the result of the author's thoroughgoing study of the life of a small, fairly typical American city. It gives a good picture of the city's activities in every direction—industrial, social, religious, family, etc. One irritating feature of the book is the continuous use of footnotes. In themselves they are interesting enough to have been included in the text. The book will probably make its greatest appeal to social workers who can find in it a correlation of the many problems they meet.

Sociology
Science News-Letter, May 4, 1929

OBREGON'S HISTORY—George P. Hammond and Agapito Rey—*Wetzel* (\$10.00). This contemporary history of sixteenth century explorations in Mexico and Southwestern United States has been translated and edited by Hammond and Rey without the loss of the picturesque style or thought of the original historian, Baltasar Obregon. According to the translators the book is a fairly accurate document. It gives an interesting though rather sanguine picture of the times.

History
Science News-Letter, May 4, 1929

TRACKING DOWN THE ENEMIES OF MAN—Arthur Torrance—*Sears* (\$3.50). Dr. Torrance has made an exciting tale of his experiences in the tropics, where he hunted the big and little game—lions, tigers, tiny insects and microscopical organisms—that threaten man's life in the tropics. The book is full of stirring, heroic occurrences, and much information on the subject of tropical diseases may be pleasantly acquired from reading it.

Tropical Medicine
Science News-Letter, May 4, 1929

ON THE BOTTOM—Commander Edward Ellsberg—*Dodd, Mead & Co.* (\$3). For adventure the mere surface of the earth has become too tame. Below the surface of the sea there are adventures that compete with those that occur in the clouds. Picked as the Literary Guild selection for May, this book dramatizes the salvaging of the S-51.

Navigation
Science News-Letter, May 4, 1929

A LABORATORY STUDY-GUIDE FOR BIOLOGY—Charles A. Gramet—*The School Book Company* (65c). The pupils who complete this course of observation in the biological laboratory will acquire a new viewpoint from which to observe the living things about them.

Biology
Science News-Letter, May 4, 1929

NINE YEARS OF THE LEAGUE OF NATIONS 1920-28—Denys P. Myers—*World Peace Foundation Pamphlets* (40c). Many consider the political aspects of the League of Nations the least important. And when one reads a summary of its constructive activities promoting health, intellectual cooperation, and other projects advancing civilization, there comes a feeling that international accord is really practical.

Political Science
Science News-Letter, May 4, 1929

WHY WE ARE MEN AND WOMEN—A. L. Benedict—*Ross* (\$2.50). This book discusses the old idea of sex determination, presenting the ancient theories and a few modern ones.

Index
Science News-Letter, May 4, 1929

YOUR EYES AND THEIR CARE—Edgar S. Thomson—*Appleton* (\$1.50). The author explains to the layman the structure and function of the eyes, the various diseases and ailments of eyes and what may be done for them. This includes an explanation of the fitting of eye glasses and of what occurs and what the treatment is in certain types of injuries.

Ophthalmology
Science News-Letter, May 4, 1929

REPORT OF THE COMMITTEE ON HEAT TRANSMISSION DIVISION OF ENGINEERING AND INDUSTRIAL RESEARCH—*National Research Council*. Heat transfer, so vital to industry in many respects, is mysterious. This small mimeographed booklet is the key to the present knowledge on radiation of heat.

Physics
Science News-Letter, May 4, 1929

GERMAN IDIOM LIST—Edward F. Haugh—**SPANISH IDIOM LIST**—Hayward Keniston—*Macmillan Co.* (60c each). Idiom has been called the soul of language. When educators list, as they have in these books, those that are used most frequently and therefore should be learned first, they are performing a service to the millions who study languages.

Language
Science News-Letter, May 4, 1929

THE HALL OF DINOSAURS—Frederic A. Lucas—*The American Museum of Natural History* (10c). For a brief journey into the age of dinosaurs, this guide leaflet is useful.

Paleontology
Science News-Letter, May 4, 1929

FUNDAMENTALS OF CHEMISTRY—Gray, Sandifur & Hanna—*Houghton Mifflin Co.* (\$1.80). A text book appearing in revised and enlarged edition.

Chemistry
Science News-Letter, May 4, 1929

BOULEVARDED OLD TRAILS IN THE GREAT SOUTHWEST—Frank H. Trego Greenberg, Inc. (\$3.50). To those who visit the great southwest rich in legend and living record, this vivid travel-talk will be interesting.

Geography
Science News-Letter, May 4, 1929

ANNUAL REPORT OF THE ENGINEERING FOUNDATION—Research in engineering is the object of the Engineering Foundation and this report for its fourteenth year lists many important projects.

Engineering
Science News-Letter, May 4, 1929

DOWN WIND—Donald and Louise Peatty—*Appleton* (\$2.50). Story-sized accounts of the lives of birds and beasts and even a broad, flat toad, together with some good pictures.

Natural History
Science News-Letter, May 4, 1929

FIVE YEARS IN FARGO—Commonwealth Fund (\$1). This report of the Commonwealth Fund Child Health Demonstration carried on for five years in Fargo, N. D., will be of especial interest to social workers, health officers, public health nurses, teachers and any others engaged in public and child health work. The report is extremely readable and pleasingly illustrated. It contains much that will be helpful to other communities that are trying to improve the health of their children.

Public Health
Science News-Letter, May 4, 1929

First Glances at New Books—Continued

THIS FILM BUSINESS—R. P. Messel—*Ernest Benn, Ltd.* (12/6). Movies are seen through English eyes in this book and those scientists who plunge into the new era which has made motion pictures articulate would do well to consult this book for hints as to one of the viewpoints from which the reborn industry is surveyed.

Motion Pictures

Science News-Letter, May 4, 1929

CIVIL AIRPORTS AND AIRWAYS—Archibald Black—*Simmons-Boardman Publishing Co.* (\$4). With over a thousand airports under construction in this country and with airways being developed as intensively as highways were a decade ago, such a book as this will undoubtedly provide the necessary information for perplexed local airport committee members and engineers entering an essentially new field.

Aviation

Science News-Letter, May 4, 1929

GENERAL PSYCHOLOGY—Leo F. Miller—*Wagner* (\$3). This concise text first presents physiological psychology, then takes up such topics as mind, will, thought, and other psychiatric phenomena, leading up to a discussion of what may be understood by the soul. Intended primarily as a text for Catholic colleges, and for readers who are interested in, and perhaps perplexed by, the problems of mind versus body.

Psychology

Science News-Letter, May 4, 1929

THE MACHINES WE ARE—R. T. Hance—*Author* (\$3.50). Prof. Hance has tried a new tack with this book. His chapters are chats, informal, not loaded with technical terms, yet good, solid physiology and not "written down" to any imaginary intelligence level. The book can be used profitably by college classes, and it can be read with pleasure and interest by the layman who has no professor to guide him.

Physiology

Science News-Letter, May 4, 1929

STRENGTH OF MATERIALS—Arthur Morley—*Longman, Green & Co.* (\$4.20). This seventh edition of a standard British text would be of greater service in the United States if it derived at least some of its examples from the testing practice of this country.

Engineering

Science News-Letter, May 4, 1929

THE FARMER'S STANDARD OF LIVING—E. L. Kirkpatrick—*Century* (\$2.) Is farm relief needed? This book is based on a six-year study of farmers and farm life by an economist of the U. S. Department of Agriculture. It is a careful study of the situation, and will interest all who are concerned with the welfare of the farmer, or the status of American agriculture.

Agriculture

Science News-Letter, May 4, 1929

RAYON INDUSTRY, 1928-29 Edition—Textile World—*McGraw-Hill* (\$1). This annual volume affords an opportunity to keep within sight of the amazingly swift advance of this new textile which has grown up in our generation. The domestic output of rayon is now increasing at the rate of 30 per cent. a year. This year it is expected to reach 129,000,000 pounds, twice as much as any other country in the world.

Chemistry

Science News-Letter, May 4, 1929

THE STORY OF FRANCE—Paul Van Lyke—*Scribners* (\$3.50). The events, lives and forces, from Julius Caesar to Napoleon III, that have made the France of today are related in this book in a most interesting and sympathetic fashion. The author has omitted all tiresome dates and names which ordinarily make history dull reading. He closes his colorful story with a convincing assertion of the peace-loving nature of the French people who "have dedicated to Pasteur more memorials than to Napoleon."

History

Science News-Letter, May 4, 1929

GOITER PREVENTION AND THYROID PROTECTION—Israel Bram—*Davis* (\$4). Dr. Bram explains the function of the thyroid gland and the development of goiter in language simple enough to be understood by those who have not had special scientific training. A brief discussion of the other ductless glands and a dietary regimen are included in the book, which will be useful to social workers and nurses and patients suffering from thyroid disturbances.

Medicine

Science News-Letter, May 4, 1929

WHAT IS DARWINISM?—T. H. Morgan—*Norton* (\$1). Two critical essays by one of America's best-known biologists, bringing some original ideas into a discussion that has begun to grow somewhat stiff from too much talking over old ones.

Evolution

Science News-Letter, May 4, 1929

STUDY AND PERSONALITY—Richard L. Sandwick—*Heath* (\$1.12). A textbook for boys and girls entering high school, designed to show them how to study and, more than that, how to make the most of themselves. There is considerable explanation, based on scientific principles, of how to concentrate, memorize, and organize a daily program to the best advantage. But before the book is finished the author has casually discussed the sporting attitude, lunch hours, choosing courses, conserving energy, cordiality, what personality is, and, in fact, practically every angle of high school life.

Education—Psychology

Science News-Letter, May 4, 1929

THE LAST GLACIATION—Ernest Antevs—*American Geographical Society* (\$3.50). A visualization of the last great ice age stirs the imagination. Now that Dr. Antevs through many years has laboriously traced its limits and fluctuations, those who desire may obtain a better understanding of the climatic conditions that preceded the age in which we live.

Geography

Science News-Letter, May 4, 1929

FIELD STUDIES IN SOCIOLOGY—Vivien M. Palmer—*Univ. of Chicago Press* (\$2.50). A student's manual, the first that has been published to aid young sociologists entering upon research and field work. Besides giving much information on methods and techniques, the author outlines in careful detail studies of three different type groups. The manual is keyed to a number of standard texts on sociology so that the student will find in it the practical application of familiar principles and theories.

Sociology

Science News-Letter, May 4, 1929

TEXTBOOK OF EVOLUTION AND GENETICS—A. W. Lindsey—*Macmillan* (\$3). The right extinguisher for the black flame of prejudiced ignorance that is threatening many of our universities and school systems is a solid knowledge of what the doctrine of evolution really means. Every college and university biology department should offer a special course in evolution. Prof. Lindsey's text could be used for such a course, without requiring even the usual Bot. I or Zool. I as a prerequisite.

Evolution

Science News-Letter, May 4, 1929